

1 22. In a multiple phase electrical system for supplying power from an AC source to one or
2 more nonlinear loads connected to at least one phase line therein, a device for substantially
3 eliminating currents in a neutral wire, said device comprising:

4 a first completely-passive parallel resonant circuit having three passive electrical branches
5 connected in parallel; and

6 said first completely-passive parallel resonant circuit is tuned to a predetermined harmonic
7 frequency of a fundamental frequency of said AC source.

1 23. A device according to claim 22, wherein:

2 said first completely-passive parallel resonant circuit is tuned to a third harmonic frequency
3 of said fundamental frequency of said AC source.

1 24. A device according to claim 22, wherein:

2 said three passive electrical branches comprise a first branch consisting of a capacitor, a
3 second branch consisting of a reactor, and a third branch consisting of a resistor.

1 25. A device according to claim 23, wherein:

2 said three passive electrical branches comprise a first branch consisting of a capacitor, a
3 second branch consisting of a reactor, and a third branch consisting of a resistor.

1 26. A device according to claim 22, wherein:

2 each phase line of said multiple phase electrical system supplies power to an associated one
3 of said nonlinear loads;

4 said device includes a second completely-passive parallel resonant circuit and a third
5 completely-passive parallel resonant circuit;

6 each of said first, second and third completely-passive parallel resonant circuits is connected
7 along a separate phase line of said multiple phase electrical system in series with at least one of said
8 nonlinear loads which has its power supplied by said separate phase line; and

9 each of said first, second and third completely-passive parallel resonant circuits is tuned to
10 said predetermined harmonic frequency of said fundamental frequency of said AC source.

1 27. A device according to claim 23, wherein:

2 each phase line of said multiple phase electrical system supplies power to an associated one
3 of said nonlinear loads;

4 said device includes a second completely-passive parallel resonant circuit and a third
5 completely-passive parallel resonant circuit;

6 each of said first, second and third completely-passive parallel resonant circuits is connected
7 along a separate phase line of said multiple phase electrical system in series with at least one of said
8 nonlinear loads which has its power supplied by said separate phase line; and

9 each of said first, second and third completely-passive parallel resonant circuits is tuned to
10 said third harmonic frequency of said fundamental frequency of said AC source.

1 28. A device according to claim 25, wherein:

2 each phase line of said multiple phase electrical system supplies power to an associated one
3 of said nonlinear loads;

4 said device includes a second completely-passive parallel resonant circuit and a third
5 completely-passive parallel resonant circuit,

6 each of said first, second and third completely-passive parallel resonant circuits is connected
7 along a separate phase line of said multiple phase electrical system in series with at least one of said
8 nonlinear loads which has its power supplied by said separate phase line; and

9 each of said first, second and third completely-passive parallel resonant circuits is tuned to
10 said third harmonic frequency of said fundamental frequency of said AC source.

1 29. A device for substantially eliminating a predetermined harmonic current generated by a
2 nonlinear load in an electrical distribution system which distributes power from an AC source, said
3 device comprising:

4 a completely-passive parallel resonant circuit connected in series with said nonlinear load;
5 said completely-passive parallel resonant circuit comprises three completely-passive
6 electrical branches; and

7 said completely-passive parallel resonant circuit is tuned to the frequency of said
8 predetermined harmonic current to change the current drawn by said nonlinear load.

1 30. A device according to claim 29, wherein:

2 said completely-passive parallel resonant circuit is tuned to a third harmonic frequency of
3 a fundamental frequency of said AC source.

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1 31. A device according to claim 29, wherein:

2 said three completely-passive electrical branches comprise a first branch consisting of a
3 capacitor, a second branch consisting of a reactor, and a third branch consisting of a resistor.

1 32. A device according to claim 30, wherein:

2 said three completely-passive electrical branches comprise a first branch consisting of a
3 capacitor, a second branch consisting of a reactor, and a third branch consisting of a resistor.

1 33. A device for reducing currents in an electrical system which supplies power to a nonlinear
2 load from an AC source, comprising:

3 a first passive electrical component connected in series with the nonlinear load;

4 a second passive electrical component connected in parallel to said first passive electrical
5 component;

6 a third passive electrical component connected in parallel to said first and said second passive
7 electrical components;

8 said first, second and third passive electrical components are tuned to a third harmonic
9 frequency of the AC source so as to substantially alter current drawn by the nonlinear load;

10 a housing member for said first, second and third passive electrical components;

11 means for connecting the nonlinear load to said parallel connection of said first, second and
12 third passive electrical components;

13 said connecting means includes an equipment rack panel member connected to said housing
14 so as to mount said housing in an equipment rack storing the nonlinear load; and

15 said equipment rack panel member is substantially perforated so as to allow airflow to pass
16 therethrough.

1 34. A device according to claim 33, wherein:

2 the nonlinear load comprises a computer having a monitor connected thereto.

1 35. A device according to claim 34, wherein:

2 said housing member includes electrical connectors for connection to said monitor and said
3 computer.

1 36. A device for reducing currents in an electrical system which supplies power to a nonlinear
2 load from an AC source, comprising:

3 a first passive electrical component connected in series with the nonlinear load;

4 a second passive electrical component connected in parallel to said first passive electrical
5 component;

6 a third passive electrical component connected in parallel to said first and said second passive
7 electrical components;

8 said first, second and third passive electrical components are tuned to a third harmonic
9 frequency of the AC source so as to substantially alter current drawn by the nonlinear load;

10 a housing member for said first, second and third passive electrical components;

11 means for connecting the nonlinear load to said parallel connection of said first, second and
12 third passive electrical components;

13 an isolation transformer connected between said AC source and said parallel connection of
14 said first, second and third passive electrical components;

15 said connecting means includes electrical sockets extending therethrough for providing
16 connection to the nonlinear load; and

17 at least one bracket member for attaching said housing member to a utility cart.

1 37. A device for reducing currents in an electrical system which supplies power to a nonlinear
2 load from an AC source, comprising:

3 a first passive electrical component connected in series with the nonlinear load;

4 a second passive electrical component connected in parallel to said first passive electrical
5 component;

6 a third passive electrical component connected in parallel to said first and said second passive
7 electrical components;

8 said first, second and third passive electrical components are tuned to a third harmonic
9 frequency of the AC source so as to substantially alter current drawn by the nonlinear load;

10 a housing member for said first, second and third passive electrical components;

11 first means for connecting the nonlinear load to said parallel connection of said first, second
12 and third passive electrical components;

13 second means, connected in series with said parallel connection of said first, second and third
14 passive electrical components, for controlling current levels drawn by the nonlinear load; and

15 said second means comprising a current limiting circuit, a circuit for detecting a rapid rise
16 in current drawn by the nonlinear load, and a switch for automatically deactivating said current
17 limiting circuit based upon signal levels detected by said current detecting circuit.

1 38. A device according to claim 37, wherein:

2 said current limiting circuit maintains a maximum current level drawn by the nonlinear load
3 to between approximately 6 and 8 amps.

1 39. A device for reducing currents in an electrical system which supplies power to a nonlinear
2 load from an AC source, comprising:

3 a completely-passive parallel resonant circuit connected in series with said nonlinear load;

Sub. 4 said completely-passive parallel resonant circuit comprises three completely-passive
E4 5 electrical branches;

6 said completely-passive parallel resonant circuit is tuned to the frequency of said
7 predetermined harmonic current to change the current drawn by said nonlinear load;

8 a housing member for said completely-passive parallel resonant circuit; and

9 means for connecting the nonlinear load to said completely-passive parallel resonant circuit.

1 40. A device according to claim 39, wherein:

2 the nonlinear load comprises a computer having a monitor connected thereto.

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1 41. A device according to claim 40, wherein:

2 said housing member includes electrical connectors for connection to said monitor and said
3 computer.